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;DEMONSTRATION OF CX-85 KEYPAD INTERRUPT HANDLER
;FLORA P. NG   3/08/82
;
;This keypad interrupt handler detects and handles all
;keys pressed on a CX-85 keypad plugged into port 2.
;This is assembled using Atari Macro Assembler.
;
TIMER   EQU     $30
TIMER1  EQU     6
START   EQU     $9    ;START MASK
SELECT  EQU     $A    ;SELECT MASK
OPTION  EQU     $C    ;OPTION MASK
BPOT    EQU     $08   ;BPOT BIT MASK
VVBLKD  EQU     $224  ;VERTICAL BLANK INTERRUPT
STRIG1  EQU     $285  ;TRIGGER 1
ATTRACT EQU     $4D   ;ATTRACT MODE FLAG
CH      EQU     $2FC  ;KEYBOARD CODE
ALLPOT  EQU     $D208 ;ALL POT STATUS
PORTA   EQU     $D300 ;PORTA
SETVBV  EQU     $E45C ;ROUTINE FOR SETTING VECTORS
DOSINI  EQU     $0C   ;WARM START ADDR
CONSOL  EQU     $D01F ;CONSOL SWITCH PORT
BREAK   EQU     $11   ;BREAK KEY FLAG
;LOCATED IN PAGE 6 BUT MAY BE REASSEMBLED ELSEWHERE
;
;INITIAL ENTRY POINT TO ESTABLISH VBLANK ENTRY
;SYSTEM RESET KEY RESETS VBLANK VECTORS,
;HENCE CHAIN TO DOS INIT
;SAVE VALUE IN DOSINI
        ORG     $600
COLDST: LDA     DOSINI
        STA     WRMEXT+1
        LDA     DOSINI+1
        STA     WRMEXT+2
;REPLACE DOSINI WITH WARMST
        LDA     #LOW WARMST
        STA     DOSINI
        LDA     #HIGH WARMST
        STA     DOSINI+1
;CHAIN KEYPAD INTO DEFERRED VBLANK PROCESSING
;SAVE VVBLKD FOR KEYPAD EXIT POINT
KPADVBI: LDA     VVBLKD
        STA     EXIT+1
        LDA     VVBLKD+1
        STA     EXIT+2
;
;REPLACE VVBLKD WITH KEYPAD ENTRY POINT
        LDY     #LOW KPAD
        LDX     #HIGH KPAD
        LDA     #7      ;DEFERRED VBI
        JSR     SETVBV
        RTS
;
;ENTERED WHEN USER HITS SYSTEM RESET
;REESTABLISH VBLANK VECTOR
WARMST: JSR     KPADVBI
WRMEXT: JMP     0       ;CHAIN TO DOSINI
;
;
;KEYPAD TRANSLATION TABLE
;
KPADTAB: DB     $0C,$0C  ;FUNCTION 1
        DB      $14,$34  ;FUNCTION 2
        DB      $10,$07  ;FUNCTION 3
        DB      $18,$26  ;FUNCTION 4
        DB      $1C,$32  ;0
        DB      $19,$1F  ;1
        DB      $1A,$1E  ;2
        DB      $1B,$1A  ;3
        DB      $11,$18  ;4
        DB      $12,$1D  ;5
        DB      $13,$1B  ;6
        DB      $15,$33  ;7
        DB      $16,$35  ;8
        DB      $17,$30  ;9
        DB      $1D,$22  ;.
        DB      $1F,$0E  ;-
        DB      $1E,$06  ;+ENTER
        DB      0        ;END OF TABLE
;ENTERED AT EACH VBLANK TO READ THE KEYPAD
KPAD:   LDA     STRIG1  ;KEY PRESSED?
        BNE     KPADDM  ;EXIT FOR KEY NOT PRESSED
        LDA     #0      ;RESET ATTRACT MODE
        STA     ATTRACT
;DETERMINE VALUE OF KEY PRESSED
        LDA     PORTA   ;READ CABLE PIN OF PORT 2
        LSR     A
        LSR     A
        LSR     A
        LSR     A
        STA     TEMP
        LDA     ALLPOT  ;READ ALLPOT FOR 5TH CABLE PIN STATUS
        AND     #BPOT   ;MASK FOR 5TH PIN
        EOR     #BPOT   ;COMPLEMENT BIT (O IS VALID)
        ASL     A
        ORA     TEMP    ;A HAS KEY VALUE
        LDY     #0      ;INIT COUNTER
;
;SCAN TRANSLATION TABLE
KPADCK: CMP     KPADTAB,Y       ;MATCH KEYPAD TABLE ENTRY?
        BEQ     KPADMAT ;JUMP IF MATCH
        INY             ;INC TO NEXT ENTRY
        INY
        LDX     KPADTAB,Y       ;END OF TABLE?
        BEQ     EXIT    ;EXIT FOR END OF TABLE
        BNE     KPADCK
;
;KEY VALUE MATCHES
;PUT NEW KEYCODE IN CH AND RESET AUTO-REPEAT
KPADMAT: TAX            ;SAVE KEY VALUE
        INY             ;GET POKEY KEYCODE
        LDA     KPADTAB,Y       ;A HAS KEYCODE
        CMP     #$FF    ;VECTOR ROUTINE?
        BEQ     KPADFUN ;EXIT FOR VECTOR ROUTINE
        CMP     KPADCOD ;SAME AS PRIOR KEYCODE?
        BEQ     KPADSAM ;BRANCH IF SAME
        STA     KPADCOD ;ELSE STORE NEW KEYCODE
        STA     CH
        LDA     #TIMER  ;RESET TIMER
        STA     KPADREP
        BNE     EXIT1
;
KPADDM: LDA     #$C0     ;LOAD DUMMY VARIABLE
        STA     KPADCOD
EXIT1:
*************************************
        LDA     #1      ;RESET BRK PRESS FLAG
        STA     BRKPRS
*************************************
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        BNE     EXIT

;SAME AS PRIOR KEY, CHECK AUTO-REPEAT
KPADSAM: LDX     KPADREP ;AUTO-REPEAT EXPIRED?
        DEX             ;DEC TIMER
        BNE     KPADXX  ;BRANCH IF NOT
        STA     CH      ;STORE KEYCODE
        LDA     #TIMER1 ;RESET TIMER
        STA     KPADREP
        BNE     EXIT1
KPADXX: STX     KPADREP
;
;EXIT THIS VBLANK INTERRUPT
EXIT:   JMP      0       ;CHAIN TO DEFERRED VBLANK
TEMP:   DB       0   ;TEMP VARIABLE
KPADCOD: DB      0   ;PRIOR KEYCODE
KPADREP: DB      $30 ;AUTO-REPEAT TIMER
;
;IF NO $FF IN TRANSLATION TABLE, THE SECTIONS
;ENCLOSED WITHIN *** MAY BE DELETED
*************************************
BRKPRS: DB       1   ;BREAK PRESS FLAG
;
;FUNCTION VECTOR TABLE
KPADFTB: DW     KPADF1   ;F1 VECTOR
        DW      KPADF2   ;F2 VECTOR
        DW      KPADF3   ;F3 VECTOR
        DW      KPADF4   ;F4 VECTOR
;GET FUNCTION VECTOR
KPADFUN: DEY
        LDA     KPADFTB,Y
        STA     KPADFV+1
        INY
        LDA     KPADFTB,Y
        STA     KPADFV+2
;CALL TO FUNCTION VECTOR
KPADFV: JSR     0       ;CALL TO FUNCTION
        JMP     EXIT
KPADF1: LDA     BRKPRS
        BEQ     KPADFR
        LDA     #0      ;BREAK PRESSED
        STA     BREAK
        STA     BRKPRS
        LDA     #$C0    ;LOAD DUMMY KEYCODE
        STA     KPADCOD
KPADFR: RTS
KPADF2: LDA     #OPTION
        STA     CONSOL
        RTS
KPADF3: LDA     #SELECT
        STA     CONSOL
        RTS
KPADF4: LDA     #START
        STA     CONSOL
        RTS
**************************************
        END     COLDST
```